



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
AIR AND RADIATION

MEMORANDUM

From: Margaret Sheppard, EPA/Global Programs Division

To: Readers of EPA Air Docket OAR-2002-0064

Subject: Documents available in public dockets A-2001-07, OAR-2002-0064, and A-91-42 concerning n-propyl bromide rulemaking

Date: July 17, 2003

Attached is an index of all items in the docket A-2001-07 (Attachment 1) for the Significant New Alternatives Policy (SNAP) Program's proposal on n-propyl bromide as of June 3, 2003, the date of publication in the *Federal Register*. All of these items are available in hard copy through EPA's Air Docket. You can request copies of specific items by calling the Air and Radiation Docket at (202) 566-1742 or by visiting the EPA Docket Center, EPA West, Room B102, 1301 Constitution Ave., NW, Washington, DC. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays.

A number of items from the SNAP program's general docket, A-91-42, are incorporated by reference into Docket A-2001-07. An index of these items is included in Attachment 2. These include the submissions to the SNAP program for review of nPB, materials concerning n-propyl bromide referenced in SNAP Notice of Acceptability #14 (65 FR 78977; December 18, 2000), and materials related to EPA's Advance Notice of Proposed Rulemaking on nPB (64 FR 8043; February 18, 1999).

For your convenience, EPA is making available a number of our background documents through the e-docket, OAR-2002-0064. These items are marked "{e}" in the attached docket index. In addition, EPA will continue to post comments and information in both the paper docket A-2001-07 and the associated e-docket OAR-2002-0064 as they become available.

Attachments

**SNAP Rulemaking on n-Propyl Bromide
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II-A

Background Documents for Notice of Proposed Rulemaking

1. Park, Jung-Sun et. al. An Outbreak of Hematopoietic and Reproductive Disorders Due to Solvents Containing 2-Bromopropane in an Electronic Factory, South Korea: Epidemiological Survey. *Journal of Occupational Health* 1997; 39: 138-143.
2. Koh, Jung-Min et.al. Primary ovarian failure caused by solvent containing 2-bromopropane. *European Journal of Endocrinology* 1998 Volume 138 pages 554-556.
3. Wuebbles, Donald J. et al. New methodology for Ozone Depletion Potentials of short lived compounds: n-Propyl bromide as an example. *Journal of Geophysical Research*, 2001; Vol. 106, No. D13, p. 14,551-14,571.
4. Wuebbles, Donald J. et al. Effects of n-Propyl bromide and other short-lived chemicals on stratospheric ozone. *Proceedings from the Symposium on Atmospheric Chemistry Issues in the 21st Century*, American Meteorological Society, Boston, 2000
5. ASTM Standard Specifcation for Vapor-Degreasing Grade and General Grade normal-Propyl Bromide.
6. EPA memorandum to Air Docket re: Incorporation of items from Docket #A-91-42 into Docket #A-2001-07 (07/19/01).
7. Ichihara G., Yu X., Kitoh J., et al. 2000a. Reproductive toxicity of 1-bromopropane, a newly introduced alternative to ozone layer depleting solvents, in male rats. *Toxicol Sciences* 54:416-423.
8. Ichihara G., Kitoh J., Yu, X., et al. 2000b. 1-Bromopropane, an alternative to ozone layer depleting solvents, is dose-dependently neurotoxic to rats in long-term inhalation exposure. *Toxicol Sciences* 55:116-123.
9. Barber E.D., Donish W., Mueller K. 1981. A procedure for the quantitative measurement of the mutagenicity of volatile liquids in the Ames *Salmonella*/microsome assay. *Mutat Res* 90:31-48.
10. EPA IRIS record for 2-Nitropropane
11. NTP- Center for the Evaluation of risks to Human Reproduction, Expert Panel Report on the Reproductive and Developmental Toxicity of 1- Bromopropane. March 2002.
12. NTP- Center for the Evaluation of risks to Human Reproduction, Expert Panel Report on the Reproductive and Developmental Toxicity of 2- Bromopropane. March 2002
13. ICF Consulting, 2002. Risk Screen for n-Propyl Bromide in Adhesive Applications (Draft Final, May 2002). {e} Attachments:
 Att. A, Derivation of an Acceptable Industrial Exposure Limit for n-Propyl Bromide {e}
 Att. B, Derivation of a Reference Concentration for n-Propyl Bromide {e}
 Att. C, Occupational Exposure Assessment for n-Propyl Bromide {e}
 Att. D, General Population Exposure Assessment for n-Propyl Bromide {e}

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14. ICF Consulting Comments on the NTP- Center for the Evaluation of Risks to Human Reproduction, Expert Panel Report on the Reproductive and Developmental Toxicity of 2- Bromopropane. Cover Letter Dated 5/9/02. {e}
15. Ichihara G., Jong X., Onizuka J., et al. 1999. Histopathological changes of nervous system and reproductive organ and blood biochemical findings in rats exposed to 1-bromopropane. (Abstract only) Abstracts of the 72nd Annual Meeting of Japan Society for Occupational Health. May 1999. Tokyo
16. Methods for derivation of inhalation reference concentrations and application of inhalation dosimetry. EPA/600/8-9/066F.
17. The Use of the Benchmark Dose Approach in Health Risk Assessment. EPA/630-R-94-007. Risk Assessment Forum, Washington, DC.
18. Amity Product Information Bulletin Sheet Ref. No. 00-003: Vapor Degreasing Good Practice. 5 June 2001.
19. November 16, 2001 Email from Mick Kassem, Albemarle Corporation, concerning exposure levels using nPB in various applications.
20. Ch. 10 through 12 from WMO (World Meteorological Organization): *Scientific Assessment of Ozone Depletion: 1998*, Global Ozone Research and Monitoring Project – Report No.44, Geneva, 1998
21. UNEP (United Nations Environmental Programme): *Geographic Market Potential and Estimated Emissions of n-Propyl Bromide*. Report by the Technology and Economic Assessment Panel (TEAP) Task Force of the Solvents, Coatings and Adhesives Technical Options Committee (STOC). April, 2001.
22. Excerpts from 1998 Report of the United Nations Environment Programme Ozone Secretariat, Solvents, Coatings and Adhesives Technical Options Committee
23. Ch. 8, “2002 Update Report on nPB,” UNEP (United Nations Environmental Programme): Report of the Technology and Economic Assessment Panel (TEAP). April, 2002.
24. Web pages from EPA Chemical Registry System, including lists of relevant EPA regulations for various solvents
25. 29 CFR 1910.1000, OSHA regulations on Air Contaminants
26. Petroferm Technical Bulletin on Minimizing Exposure Levels to n-Propyl Bromide
27. HCFC-141b Sales by End-Use Category, Data from the Web Site of the Alternative Fluorocarbon Environmental Acceptability Study. 2002.
28. Kimmel and Gaylord, 1988. Kimmel, C. and Gaylor, D. 1988. Issue in qualitative and quantitative risk analysis for developmental toxicology. *Risk Anal* 8:15-21.
29. Barber E.D., Donish W. An exposure system for quantitative measurements of the microbial mutagenicity of volatile liquids.

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Background Documents for Notice of Proposed Rulemaking**

30. Crump, 1984. Crump, K.S. 1984. A new method for determining allowable daily intakes. *Fundam. Appl. Toxicol.* 4:854-871.
31. NIOSH Health Hazard Evaluation Report: HETA#2000-0410-2891, STN Cushion Company, Thomasville, NC, August 2002
32. Yamada T., G. Ichihara et al., 2003. Exposure to 1-Bromopropane Causes Ovarian Dysfunction in Rats. *Toxicol Sci* 71:96-103
33. Wang, Hai Lan et al., "Subacute Effects of 1-Bromopropane on Reproductive Organs and the Nervous System." Abstracts of the 72nd Annual Meeting of the Japan Society for Occupational Health, May 1999. In *J Occu. Health* 41:306.
34. IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans: Some Industrial Chemicals and Dyestuffs, Vol. 29, pages 331-343, 1982. Includes update from Vol. 71, page 1079, 1999.
35. Griffin, E., Wilson D. Disorders of the Testes. In: Isselbacher K, Baunwald E, Wilson J, Martin B., et al. eds. *Harrison's Principles of Internal Medicine*. 13th ed. New York, McGraw Hill; 1994:2006-2017.
36. Purvis K, Christiasen E. Male infertility: current concepts. *Ann Med* 1992; 24:258-272.
37. Article from September 22, 1999 issue of Chemical Week on Isopropyl Alcohol Prices
38. July 19, 2001 Memorandum from ICF Consulting to M. Sheppard, EPA Re: Assessment of nPB Use in Adhesives Market: iPB Levels
39. Memo from ICF Consulting to M. Sheppard EPA, 7/30/01 Re: Preliminary Summary of Responses to Questions for nPB Users in Industry
40. 1997 Economic Census, Manufacturing Industry series. U.S. Census Bureau, U.S. Dept. of Commerce. Data from selected NAICS codes.
41. Brake Cleaning in Auto Repair Facilities: The Conversion to Water September, 1999 report by Mike Morris and Katy Wolf, Institute for Research and Technical Assistance
42. Radian memorandum to Paul Almodovar, EPA, estimating the number of halogenated solvent cleaners. May 26, 1993.
43. Economic Impact Analysis of the Degreasing NESHAP, November 1993.
44. Excerpts from Economic Analysis for OSHA's Revised Standard for Methylene Chloride prepared by CONSAD
45. Excerpts from Final Economic and Regulatory Flexibility Analysis for OSHA's Standard for Occupational Exposure to Methylene Chloride. Office of Regulatory Analysis, Occupational Safety and Health Administration, January 7, 1996.
46. Science Policy Council Handbook: Peer Review, 2nd Edition. EPA/100-b-00-001. Office of Science Policy, Office of Research and Development. Dec. 2000.
47. ICF Communications with Dr. William Kenyon, September - December 2001.
48. Sinclair, Steven. Male Infertility: Nutritional and Environmental Considerations.

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Background Documents for Notice of Proposed Rulemaking**

49. NIOSH Health Hazard Evaluation Report: HETA #98-0153-2883 Custom Products, Inc. November 2002.
50. Wang, Hailan; Gaku Inchiara et. al. *Toxicological Sciences* Jan. 14, 2002 p.114-120. "Biochemical Changes in the Central Nervous System of Rats Exposed to 1-Bromopropane for Seven Days".
51. Guidelines for Developmental Toxicity Risk Assessment. EPA/600/FR-91/001. Risk Assessment Forum, Dec. 5, 1991.
52. Brief Discussion of the BMD Approach: Overview of its Purpose, Methods, Advantages, and Disadvantages. EPA, August 28, 2001.
53. SCREEN3 Model User's Guide. EPA-454/b-95-004. Sept. 1995.
54. Memo from M. Nolan, ICF Consulting to M. Sheppard, EPA. Re: Initial Screening of Impacts on Small Businesses Using nPB, 8/30/01.
55. Memorandum from K. Altshuler and M. Wagner, ICF to E. Birgfeld, EPA, 3/24/03. Includes: ICF Response to California Health Evaluation System and Information Service (HESIS), 2002.
56. Spreadsheet Analysis of Economic Impacts on the Adhesives Sector. EPA and ICF.
57. Spreadsheet Analysis of Economic Impacts. EPA and ICF.
58. Summary of Data on Workplace Exposure to n-Propyl Bromide, May 21, 2003. EPA's summary of exposure data from nPB suppliers and NIOSH. {e}
59. ICF Consulting Review of NPB AEL Recommendation Proposed by SLR International Corporation {e}
60. ICF Consulting Review of NPB AEL Recommendation Proposed by Doull and Rozman {e}
61. ICF Consulting Review of NPB AEL Recommendation Proposed by Environ Corporation {e}

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II-B

Presentations, Meeting Minutes and Telephone Call Summaries

62. Briefing materials from November 6, 2000 meeting between EPA and Albemarle Corp. staff on nPB
63. Minutes of OMB meeting on EPA's Proposed SNAP Rule for nPB, 2/5/03.
64. Telephone Log of March 28, 2001 call between Margaret Sheppard, EPA, and Amanda Thomas, Franklin International
65. Notes on 4/2/2001 meeting with Dov Shellef, Mike Ruckriegel of PolySystems
66. Telephone Log of April 4, 2001 call between Margaret Sheppard, EPA, and Bob Seilheimer, Imperial Adhesives
67. Minutes of meeting with Halogenated Solvents Industry Alliance (HSIA) 10/17/2001
68. Telephone Log of November 16, 2001 call between Margaret Sheppard, EPA, and Katy Wolf and Mike Morris, IRTA.
69. Notes on 5/2/01 telephone call between Margaret Sheppard, EPA/GPD and Dan Mennis, STN Cushion Company
70. Notes on 5/3/01 telephone call between Margaret Sheppard, EPA/GPD and David McKnight, Custom Products
71. Notes on 5/3/01 telephone call between Margaret Sheppard, EPA/GPD and Mark Kaiser, Marx Industries
72. Notes on September 25, 2001 telephone calls between Margaret Sheppard, EPA/SNAP program, and John Gordon and George Parker, Mid-South Adhesives
73. Notes on October 1, 2001 conference call between Margaret Sheppard, EPA/SNAP program, and Fred Walnut, John Poinecka, and Ron Sendeling, TACC Adhesives
74. Telephone Log of October 24, 2001 call between Margaret Sheppard, EPA, and Bob Seilheimer, Imperial Adhesives
75. Case Studies of Aerospace Subcontractor Conversions, Presentation by Katy Wolf, Institute for Research and Technical Assistance, December 12, 2001, Scottsdale Solvent Substitution Conference
76. Report from Solvents background trip in L.A. 2/23/-2/24/01
77. Telephone log, Call with R. Murphy, Degreasing Devices Company, August 6, 2002
78. Presentation to the EPA Office of Air and Radiation by the International Brominated Solvent Association, 9/17/02.
79. Telephone log of call between J. Cohen, EPA and B. Biles, Arnold & Porter on behalf of BSOC, Sept. 2002.
80. Update on EPA's Proposed Rule on n-Propyl Bromide. Presentation by Margaret Sheppard, EPA, March 30, 2003. APEX Conference, Cleaning and Coating Committee.

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**II-C
Agency Correspondence**

1. Memorandum from Drs. Sally Darney and Gary Klinefelter to Jeff Cohen re: Acceptable exposure limit for nPB
2. 6/7/2001 Letter from M. Sheppard, EPA to M. Ruckriegel, Poly Systems
3. 6/7/2001 Letter from M. Sheppard, EPA to C. Wolf, Ultronix Inc.
4. 6/7/2001 Letter from M. Sheppard, EPA to J. McChesney, Detrex
5. 6/7/2001 Letter from M. Sheppard, EPA to J. Harmon, Branson Ultrasonics Corp.
6. 6/7/2001 Letter from M. Sheppard, EPA to L. Clark, Envirotech
7. 6/7/2001 Letter from M. Sheppard, EPA to J. Barkes, ZEP Manufacturing
8. 6/7/2001 Letter from M. Sheppard, EPA to D. Leonard, AMREP
9. 6/12/2001 Letter from M. Sheppard, EPA to M. Monaghan, Petroferm
10. 6/12/2001 Letter from M. Sheppard, EPA to W. Mouser, Crest-Forward Technology, Inc.
11. May 14, 2003 Memorandum from M. Sheppard, EPA to EPA Air Docket A-2002-07 concerning additional items incorporated by reference into Docket A-2001-07 from Docket A-91-42

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**II-D
Submission and Comments from Outside the Agency**

1. Enviro Tech International, Inc., March 6, 1998.
Toxicological data
2. SLR International Corp, April 2, 2001.
Human *in vitro* bioassays conducted by EnviroMed Laboratories
3. EPA SNAP application submitted by EnviroTech International, Inc., January 5, 1996.
(originally submitted under EPA Air Docket A-91-42, Control number VI-D-138)
4. Wuebbles, Donald J. 2001. "Expected response of stratospheric ozone to recent use of nPB in the United States." Written for Enviro Tech International, Inc. 2001.
5. Wuebbles, Donald J. 2001. "What constitutes a short-lived gas for evaluating ODPs?"
Department of Atmospheric Sciences, University of Illinois-Urbana.
6. Letter from Dept. of Health and Human Services to Custom Products, Inc., December 1, 1999. Re: results of Dec. 1998 survey of workplace exposure to nPB at Custom Products.
7. Letter from Dept. of Health and Human Services to Marx Industries, Inc., February 1, 2000. Re: results of nPB exposure assessment survey conducted Nov. 16-17, 1999.
8. Letter from Dept. of Health and Human Services to Custom Products, Inc., December 21, 2000. Re: results of nPB exposure assessment survey conducted Nov. 16, 2000.
9. Letter from Dept. of Health and Human Services to STN Cushion Company, March 7, 2001. Re: Results of nPB exposure assessment survey conducted November 14, 2000.
10. WIL Research Laboratories. An inhalation two-generation reproductive toxicity study of 1-bromopropane in rats submitted by the Bromine Solvent Consortium. Completed on May 24, 2001. (7 volume report)
11. NIOSH Health Hazard Evaluation Report of nPB exposure from cold vapor degreasers at Trilithic, Inc. (HHE Report 2000-0233-2845)
12. Letter from Swanson, Martin & Bell dated July 12, 2001. RE: Derivation of Occupational Exposure Limit for n-Propyl Bromide.
13. Inhalation and Reproduction Toxicity on Rats by 1-BP Repeated Dose by Japan Bioassay Research Center (Summary of unaudited data)
14. Derivation of an Occupational Exposure Limit for n-Propyl Bromide, prepared by John Doull, Ph.D., M.D., and Kark K. Rozman, Ph.D., D.A.B.T. submitted by Envirotech International, Inc.
15. Inhalation Occupational Exposure Limit for n-Propyl Bromide, July 17, 2001. Prepared by SLR International Corp. Prepared for Enviro Tech International, Inc. 2001.
16. Letter to Dov Shellef, President, Poly Systems USA, Inc. from Joel B. Charm CIH, Charm HS&E International Inc. re: n-Propyl Bromide

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17. Atmospheric and Environmental Research, Inc. Estimates of the Atmospheric Lifetime, Global Warming Potential and Ozone Depletion Potential of n-Propyl bromide. *Independent study prepared for Albemarle Corporation*, 1995
18. Email from Blake Biles to Jeff Cohen on behalf of the Brominated Solvents Consortium (BSOC). Contains the BSOC estimates of world-wide nPB sales for the calendar years 2000, 2001, 2002.
19. n-Propyl Bromide recommended exposure levels from various companies involved in the manufacture, distribution and formulation of nPB containing solvents. Compiled by Brian Ellis and sent to the EPA on April 6th, 2001.
20. Supplemental Material Submitted by Envirotech International Inc.: Yu, X. et. al. Neurotoxicity of 2-bromopropane and 1-bromopropane, *Alternative Solvents for Chlorofluorocarbons*. Environmental Research 85(1):48-52 (2001).
21. Letter dated August 28, 2001, to EPA from Envirotech: Submission of three Toxicological Articles, and bibliography of 1-bromopropane toxicological tests and studies prepared by Enviro Tech International, Inc.
22. Zhao,W. et. al., J. Occup Health 1999, Vol 41 No. 1 pp. 1-7. *Electrophysical Changes Induced by Different Doses of 1-Bromopropane and 2- Bromopropane*.
23. Kim . H., et. al. J. Occup Health 1999, Vol 41 No. 2 pp. 121-128. *Acute and Repeated Inhalation Toxicity of 1-Bromopropane in SD Rats*.
24. Fueta, Y. et. al., J. Occup Health 2000, Vol 42 No. 3 pp. 149-151. *Decreased Paired-pulse Inhibition in the Dentate Gyrus of the Brain in Rats Exposed to 1-Bromopropane Vapor*.
25. Bibiography of Toxicological Studies Regarding n-Propyl Bromide prepared by Enviro Tech International, Inc.
26. Letter dated August 24, 2001, from Karl K. Rozman Ph.D. D.A.B.T. and John Doull Ph.D., M.D. to Micheal Maher of Swanson, Martin and Bell
27. Final Report "A Developmental Toxicity Study in Rat via Whole Body Inhalation Exposure". Submitted by the Brominated Solvents Committee.
28. Kawai, T., et al., Biomarkers, 2001, Vol 6, No. 5, pp. 303-312. Biological monitoring of occupational exposure to 1-bromopropane by means of urinalysis for 1-bromopropane and bromide ion. Submitted by Envirotech International along with a cover memo dated January 16, 2001.
29. "The Effect of Short Atmospheric Lifetimes on Stratospheric Ozone" Donald J. Wuebbles Ph.D., University of Illinois, Urbana. Submitted by Envirotech Intl., 2/13/02
30. Letter dated 3/27/2002 from Phillip L. Bates, Tulstar Products, Inc. Re: workplace exposure level for nPB.
31. Letter dated 3/27/2002 from Larry Clark, President, Envirotech Intl Re: workplace exposure level for nPB.

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32. Letter dated 3/27/2002 from Dov Shellef, Polysystems USA, Inc. Re: workplace exposure level for nPB.
33. Letter dated 3/27/2002 from Michael Spiegelstein Ph.D., VP for R&D and HSE, Dead Sea Bromine Group. Re: workplace exposure level for nPB.
34. Sclar, Gary, "Case Report: Encephalomyeloradiculoneuropathy following exposure to an industrial solvent" *Clinical Neurology and Neurosurgery* Vol. 01(1999) 99-202.
35. Ichihara. G. et al., Poster presentation titled: "Neurological abnormality in workers of 1-bromopropane factory", Presented at the Society of Toxicology Meeting, Wednesday, March 20 Poster ID:1236.
36. Letter dated 4/1/2002 from Benjamin J. Laux, Chemical Engineer, DuBois Chemicals. Re: workplace exposure level for nPB.
37. Letter dated 4/25/02 from Heather Bowen, Director of Environmental Affairs, Electronic Industries Alliance
38. Letter dated 5/7/02 from Richard Morford, General Counsel Envirotech Int'l. Enclosures include:
 - a) Memo from Mark Stelljes, Ph.D. to Rich Morford, Envirotech Re: Review of Russian Articles on Alkylbromides
 - b) Kosenko, A.M.(1972a) Parameters of Acute Toxicity of Certain Alkyl Bromides [Translated from Russian]
 - c) Kosenko, A.M. Characteristics of Skin-Resorption Activity of Some Aliphatic Bromohydrocarbons. [Translated from Russian]
 - d) Kosenko, A.M., Toxicology of Some Bromide-Containing Aliphatic Hydrocarbons. [Translated from Russian]
 - e) Kosenko, A.M. Distribution and Excretion of Alkyl Bromides From the Organism. [Translated from Russian]
 - f) Bibliography of 1-bromopropane toxicological tests and studies as of May 7, 2002.
39. Sekiguchi S. et al. Effects of 1-bromopropane, 2-bromopropane, and 1,2, dichloropropane on the estrous cycle and ovulation in F344 rats. *Toxicology Letters* 126 (2002) 41-49. Submitted by Envirotech International, in a letter dated May 8, 2002.
40. Letter dated 5/8/02 from Richard Morford, General Counsel Enviro Tech Int'l. Re: Submission of Information to Docket A-2001-07; n-propyl bromide (reference: item II-D-34 in Docket A-2001-07) Enclosures include:
 - a) Letter dated January 5, 2000 from J. Beisemeir, Great Lakes Chemical Corporation to R. Rubenstein, US EPA
 - b) Letter dated January 28, 2000 from J. Beisemeir, Great Lakes Chemical Corporation to R. Rubenstein, US EPA

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41. Letter dated June 4, 2002 from L. Clark, Enviro Tech International to J. Holmstead, Assistant Administrator for Air and Radiation, EPA Enclosures include:
 - a) Memo date 5/29/02 from M. Stelljes to R. Morford Re: Review of Acceptable industrial exposure limit for n-Propyl bromide, prepared by ICF Kaiser (May, 2002)
 - b) Letter dated May 31, 2002 from Drs. Rozman and Doull, University of Kansas Medical Center to R. Morford, Enviro Tech International
 - c) Letter dated August 24, 2002 from Drs. Rozman and Doull, University of Kansas Medical Center to M. Maher, Swanson, Martin and Bell
 - d) Letter dated January 10, 2002 from J. Pierce, Applied Industrial Hygiene, Inc. to K. Rozman
 - e) ICF Consulting's May 2002 Acceptable Industrial Exposure Limit for n-Propyl Bromide
42. Letter dated June 28, 2002 from G. TerHaar, Albemarle Corp. to J. Cohen, EPA concerning risk screen for n-Propyl Bromide
43. Letter dated August 2, 2002 from R. Morford, Enviro Tech International to M. Sheppard, EPA re: n-propyl bromide; includes articles and letters written by Drs. Doull, Rozman, and Stelljes
44. Alternative Chemicals/Technologies to Replace Ozone Depleting Solvents, Presentation by William Kenyon, Global Center for Process Change and Joe Felty, Raytheon Systems Company, for the 16th Meeting, Solvents Sector; Washington D.C., May 2, 2000
45. February 1, 2000 Tabulation of Flammability Studies on n-Propyl Bromide from the Brominated Solvents Committee, and other information on flammability of n-propyl bromide
46. Letter dated April 2, 2001 from J. Lazarro, Bostik Findley to M. Sheppard, EPA re: n-Propyl Bromide Contractor Exposure Study
47. 1/25/02 fax from H. Lancon, Albemarle Corp. to M. Sheppard, EPA re: Abzol-- nPB exposure monitoring
48. August 16, 2001 email from R. Morford, Enviro Tech International to E. Birgfeld, EPA, summary of exposure levels for various solvents
49. Lenium Vapor Degreasing Operator Manual, Petroferm Inc., 2001
50. Abzol Users' Manual from Web site of Albemarle Corp.
51. October 9, 2001 Comments from S. Risotto, Halogenated Solvents Industry Alliance, on the proposed NESHAP for flexible polyurethane foam fabrication operations
52. April 25, 1994 Comments of the Polyurethane Foam Association on OSHA's proposed rule on occupational exposure to methylene chloride
53. December 17, 1993 comments from S. Risotto, Center for Emissions Control on OSHA's proposed rule on occupational exposure to methylene chloride

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54. May 19, 1994 presentation by S. Risotto, Center for Emissions Control, "Ventilation of Flexible Foam Fabrication Operations," for the Polyurethane Foam Association Technical Program
55. May 7, 2001 Email from K. Beauregard, Assistant Director, Occupational Safety and Health Division of North Carolina to M. Sheppard, EPA
56. July 17, 2002 Letter from Dr. Darol Dodd to J. Cohen re: Review and Comment on ICF Report "Acceptable Industrial Exposure Limit for N-Propyl Bromide"
57. July 19, 2002 Letter from Dr. William Brock to J. Cohen re: Review of the Criteria for Setting Exposure Limit for nPB
58. August 23, 2002 letter from R. Morford, Enviro Tech International, to M. Sheppard, EPA forwarding August 21, 2002 letter from Dr. F. J. Murray, Murray Associates Re: n-Propyl Bromide
59. September 6, 2002 letter from R. Morford, Enviro Tech International, to M. Sheppard, EPA forwarding report, "Risk Analysis and Product Stewardship: A Guide for Manufacturers" by Dr. J. Rodricks, ENVIRON International Corp.
60. Record of September 5, 2002 Meeting with the International Brominated Solvents Association Inc. (IBSA)
61. Record of September 17, 2002, meeting with Electronics Industry Association (EIA)
62. September 27, 2002 informal comments on ICF's proposed AEL for 1-Bromopropane from Dr. J. Quint, Hazard Evaluation System and Information Service, California Department of Health Services
63. Karl K. Rozman and John Doull. Derivation of an Occupational Exposure Limit (OEL) for n-Propyl Bromide Using an Improved Methodology. *Applied Occupational and Environmental Hygiene*. Volume 17(10): 711-716 (2002). Recieved in a November 11, 2002 fax from M. Ruckriegel, Poly Systems, "Information Supporting N-Propyl Bromide as a Solvent for use in Industrial Manufacturing Adhesives"
64. "Neurological Disorders in Three Workers Exposed to 1-Bromopropane," *Journal of Occupational Health* 2002: Vol. 44: 1-7, G. Ichihara et al.
65. October 21, 2002 remarks from Dr. J. Rodricks, Environ, to R. Morford, Enviro Tech International concerning derivation of an OEL for n-propyl bromide with cover letter to EPA from Enviro Tech International
66. April 16, 2001 revised draft, "Projecting Future Solvent Demand" from A. McCulloch, University of Bristol and Marbury Technical Consulting with cover letter to EPA from Enviro Tech International
67. November 12, 2002 Letter from Michael Ruckriegel, Marketing Director, PolySystems USA Inc. ACGIH Journal with Occupational Exposure Limit for nPB attached.

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68. January 21, 2003. Letter from George M Rusch, Ph.D. DABT,FATS, Director of Toxicology and Risk Assessment, Honeywell International to Christine Todd Whitman, Administrator, EPA. Re: n-Bromopropane.
69. Alternative Adhesive Technologies in the Foam Furniture and Bedding Industries: A Cleaner Technologies Substitutes Assessment. Vol. 2, Risk Screening and Comparison. The University of Tennessee Center for Clean Products and Clean Technologies, Aug. 15, 2001 draft.
70. Alternative Adhesive Technologies in the Foam Furniture and Bedding Industries: A Cleaner Technologies Substitution Assessment, Cost and Performance Evaluation. Michael Morris and Katy Wolf, Institute for Research and Technical Assistance. Prepared for the U.S. EPA Office of Pollution Prevention Technology, June 2000.
71. Emails between M. Kassem, Albemarle and M. Sheppard, EPA. Re: Spec Sheet/ Certificate of Analysis, 11/02/02.
72. August 28, 2001 email to W. Kenyon for ICF Consulting re: Questions from Bill Kenyon re: nPB market
73. Email from M. Mamber, Ameri-Cure to M. Sheppard, EPA re: costs of fire suppression in spray booths
74. 7/27/01 Email from R. Singh, Amity International, to M. Sheppard, EPA re: content of iPB impurities in nPB
75. Email from P. Gormley, Thermal Equipment Corporation to M. Sheppard, EPA re: some questions about Baron-Blakeslee vapor degreasers, 4/2/01.
76. Questionnaire for nPB Users in Industry from Ultronix Corp.
77. Approved Product Specification sheet on Abzol, 9/25/02. Provided by Albemarle on 10/31/02.
78. Letter from O. M. Kassem, Albemarle to Kevin Bromberg, Small Business Administration. Re: n propyl bromine SNAP, 1/10/03.
79. Letter from J. Linnell, Electronic Industries Alliance to Paul Noe, OMB.
80. Letter from E. Stouder, Great Lakes Chemical Corporation, 2/20/01.
81. Fax from M. Boucher, McKenna, Long & Aldridge to M, Sheppard, EPA, 11/18/02.
Enclosures include:
 - a) Letter from C. O'Connor, McKenna, Long & Aldridge to J. Pemberton, EPA. Re: International Brominated Solvent Association, Inc. –Propyl Bromide, 11/15/02.
 - b) Letter from J. Rodricks to R. Morford, General Counsel for Enviro Tech International, Inc. 10/21/02.
 - C)ICF Consulting. Evaluation of the Use of Safety/Uncertainty Factors in the Derivation of Occupational Exposure Levels by ACGIH. Prepared from Enviro Tech, Feb. 2001.

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II-D

Submission and Comments from Outside the Agency

82. Letter from R. Morford, General Council for Enviro Tech to J. Holmstead, EPA. Includes white paper from Center for Regulatory Effectiveness, 11/4/02.
83. Development of an Occupational Exposure Limit for n-Propyl Bromine Using Benchmark Dose Methods, 8/19/02
84. Email from R. Singh, Amity International, to M. Sheppard, EPA. Re: Costs for high purity of nPB, Sept. 2001.
85. Letter from C. Wolf, Ultronix to M. Sheppard, EPA 7/9/01.
86. Cleaner Technologies Substitutes Assessment Case Studies: Foam Fabrication. Institute for Research and Technical Assistance, Dec. 2000.
87. Various websites on properties of nPB. Information printed 10/31/02.
88. Letter from T. Werkema, Atofina Chemicals, to J. Cohen, EPA Re: US EPA Proposed SNAP Rule on n Propyl Bromide
89. Airborne Exposure Assessment of 1-Bromopropane, 1998
90. Letter from T. Weiss Cohen, Dead Sea Bromine Group, to B. Raday, Embassy of Israel, May 14, 2003

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III-A

Notice of Proposed Rulemaking submitted for Interagency review

1. Protection of Stratospheric Ozone; Listing of Substitutes for Ozone-Depleting Substances n-Propyl Bromide. Submitted to OMB, 11/14/02.
2. Protection of Stratospheric Ozone; Listing of Substitutes for Ozone-Depleting Substances n-Propyl Bromide. Revised from previous draft and incorporating comments from interagency review. Submitted to OMB, 2/13/03.
3. Economic Impacts: Options for SNAP Decision on n-Propyl Bromide. EPA Staff Report, March 20, 2003. {e}

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III-B

Support Documents for Proposal during Interagency Review

1. Notes on 1/24/02 telephone call between Margaret Sheppard, EPA and Tom Tattersal, MicroCare.
2. Email from M. Sheppard, EPA to A. Farrell, OMB. Re: Economics evaluation for nPB, 1/16/03. Contains Draft of Economic Impacts: Options for SNAP Decision on n-Propyl Bromide. Draft EPA Staff Report, Nov. 18, 2002.

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III-C
Comments during Interagency Review

1. Memorandum from Jeff Cohen to Amy Farrell. Re: Use of an additional uncertainty factor for susceptible human subpopulations.
2. OMB comments.
3. Small Business Administration comments.
4. Small Business Administration edits, 2/11/03.
5. OMB comments on toxicity.
6. NIOSH comments on EPA Draft Register Notice on Protection of Stratospheric Ozone; Listing of Substitutes for Ozone Depleting Substances n-Propyl Bromide, 2/10/03.
7. Email from J. Cohen, EPA to N. Beck, OMB. Re: nPB/SBA. Includes EPA response to OMB and SBA titled: IRIS Reference Dose (RfD) and Reference Concentration (RfC) Database Search, 1/24/03.
8. EPA Response to OMB. Chemicals exhibiting reproductive health effects.
9. Email from S. Block, Director of Marketing and Sales for ChemPoint to J. Cohen, EPA. Re: SNAP, 1/29/03.
10. Email from A. Garrett, Garrett Services, Inc. to J. Cohen, EPA. Re: nPB and SNAP, 2/4/03.
11. Email from J. Cohen, EPA to A. Farrell, OMB. Re: nPB, 2/12/03.
12. Emails between M. Sheppard, EPA and N. Beck, OMB. Re: Response to your comments, 2/6/03.
13. Emails between N. Beck, OMB and K. Bromberg, Small Business Administration. Re: Doull Rozman ICF, 2/11/03.
14. Emails between A. Farrell, OMB, M. Sheppard, EPA, E. Birgfeld, EPA and K. Bromberg, Small Business Administration. Re: Questions and Comments, 2/12/03.
15. Email from A. Farrell, OMB to J. Cohen, EPA. Re: nPB, 2/14/03.
16. Email from D. Votaw, CDC to E. Birgfeld, EPA. Re: Bullets per our discussion today, 2/11/03.
17. Draft of proposed nPB rule containing comments from OSHA, NIOSH, OMB, and SBA, 2/4/03.
18. Email from A. Farrell, OMB to M. Sheppard, EPA. Re:nPB edits. Contains draft of proposed nPB rule with additional comments, 2/11/03.
19. Emails between J. Cohen, EPA, A. Farrell, OMB and others. Re: npb, 1/14/2003.
20. Email from K. Bromberg, Small Business Administration to J. Cohen, EPA and others. Re: SBA Draft Position nPB Three Major Issues, 11/21/03.
21. Emails between A. Farrell, OMB, E. Birgfeld, EPA, K. Bromberg, Small Business Administration and others. Re: Questions and Comments-SBA Answers, 2/12/03.
22. Email from J. Cohen, EPA to A. Farrell, OMB. Re: nPB, 2/12/03.

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**III-C
Comments during Interagency Review**

23. Email from A. Farrell, OMB to E. Brigfeld, EPA. Re: Revised nPB preamble/rule, 2/10/03. Contains draft of proposed nPB rule with additional comments from OMB.
24. Emails between J. Cohen, EPA, A. Farrell, OMB and several others in a variety of federal agencies. Re: EO 12866 Review-npb SNAP rule, 1/02/02.

Items incorporated by reference from SNAP Program General Docket, A-91-42

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Category VI-D
Documents Submitted to EPA under SNAP

	<u>Author</u>	<u>Type</u>	<u>Sector</u>
114.	Albemarle Corporation 7/19/95 Additional information from Robert Smith (ABZOL) ICF: Exposure Limits for n-Propylbromide (2) Exposure levels for ABZOL Letter from EPA to Albemarle (8/13/98)	submission letter memos fax from Albemarle	solvents
138.	Enviro Tech, Int'l Ensolv 1/30/96	application	halogenated solvent mixture
237.	IPI International, Inc.(3/25/99) n-propyl bromide as foam blowing agent	Submission letter	Foams
248.	North American Fire Guardian Technology Inc. NAF S-125B (6-7-99)	Submission	Fire Suppress.
270.	Elf Lubricants North America (10/04/00) nPb substitute for HCFC-141b	Submission	solvents
271.	Elf Lubricants North America (10/12/00) Notification letter of intent to test market nPb	Notification	solvents

Docket A-91-42
Category IX-B
Background Documents for Final Rulemakings

Background Documents for Notice 14 (12/18/00: 65 FR 78977)

61. Information on Albermarle Corp.'s n-propyl bromide workplace exposure guideline:
 - a. Form letter to distributors and customers
 - b. "Regulatory Status" of Albemarle's ABZOL cleaner (containing n-propyl bromide)
 - c. "Product Data" of Albemarle's ABZOL cleaner (containing n-propyl bromide)
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64. Wuebbles, D.J., Patten, K.O., Johnson, M.T., Kotomarthi, R.; The New Methodology for Ozone Depletion Potentials of Short-Lived Compounds: n-Propyl Bromide as an Example June 26, 2000 Draft.

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Background Documents for Advance Notice of Proposed Rulemakings

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5. ClinTrials. 1997b. ALBTA1: A 13-Week Inhalation Study of a Vapor Formulation of ALBTA1 in the Albino Rat. Report No. 91190. Prepared by ClinTrials BioResearch Laboratories, Ltd., Senneville, Quebec, Canada. February 28, 1997. Sponsored by Albemarle Corporation, Baton Rouge, LA.
 - (a) Volume 1
 - (b) Volume 2
 - (c) Volume 3
 - (d) Volume 4
6. Cunningham, M; Matthews, H. 1991. Relationship of hepatocarcinogenicity and hepatocellular proliferation induced by mutagenic noncarcinogens vs. carcinogens, II. 1- vs. 2-nitropropane. *Toxicology and Applied Pharmacology* 110:505-513.
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10. Elf Atochem S.A. 1995b. Acute Dermal Toxicity in Rats. N-Propyl Bromide. Study No. 13113 Tar. Study Director, Stephane de Jouffrey. Study performed by Centre International de Toxicologie, Miserey, France. September 26, 1995.
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12. Elf Atochem S.A. 1996. Amendment to Protocol. n-Propyl Bromide. Study No. 13293 MLY. Amendment No. 01. Study Director, Brigitte Molinier. January 29, 1996.
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23. ICF. 1996a. "1-Bromopropane ODP Estimate." Memorandum prepared by ICF Incorporated, Washington, DC, for EPA, under Contract No. 68-D5-0147, Work Assignment No. 0-13 (January 16, 1996).
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